CLAIMS

1. A non-therapeutic method for achieving an increased level of at least one PPAR/RXR heterodimer activator in a livestock product for human consumption, in particular in skeletal meat, milk and/or eggs, in which method livestock animals, used in agri- or aquaculture for producing the livestock product, are made to ingest at least one product comprising said PPAR/RXR heterodimer activator and/or a precursor thereof which is metabolised by the livestock animals into said PPAR/RXR heterodimer activator, over such a period of time and in such an amount that the PPAR/RXR heterodimer activator is accumulated in the livestock animal so that said increased PPAR/RXR heterodimer activator level is achieved in the livestock product, characterised in that said PPAR/RXR heterodimer activator is phytanic acid, a metabolite of phytanic acid, a derivative of phytanic acid or of said metabolite, or a combination thereof and, in order to accumulate the PPAR/RXR heterodimer activator in the livestock animal, a predetermined amount of said product is given to the livestock animals over at least one period of at least three days, during which the livestock animals ingest a total amount of F kg feed dry weight, which predetermined amount of said product contains at least 5 x F meq, preferably at least 10 x F meq, and more preferably at least 15 x F meq of said PPAR/RXR heterodimer activator and/or precursor thereof.

2. A method according to claim 1, characterised in that said product comprises as said PPAR/RXR heterodimer activator or as said precursor thereof at least one compound selected from the group of compounds which correspond to the following formulas:
CH_3-CR_1H-CH_2-CH_2-CH_2-CR_2H-CH_2-CH_2-CH_2-CR_3H-CH_2-CH_2-$(CH_2)_m$-R_4
and CH_3-CR_1H-CH_2-CH_2-CH_2-CR_2H-CH_2-CH_2-CH_2-CR_3H-R_5,
wherein:

each of R_1, R_2, R_3 and R_6 is either CH_3, C_2H_5 or C_3H_7;

m = 0 - 2;

R_4 = CH_2-CR_6=CH-CH_2OH;

CH_2-CR_6=CH-CHO;

CH_2-CR_6=CH-COOH;

CH_2-CR_6H-CH_2-COOH;

CH_2-CR_6H-CHOH-COOH;

CH_2-CR_6H-CH_2-CH_2OH;

CH_2-CO-CH_2-COOH;

CH_2-CR_6H-COOH;

$CHOH_2$-CR_6H-COOH;

CH_2-CR_6H-CH_2-CH_2OH;

CH_2-CR_6H-CHO;

CH=CR_6-COOH;

CO-CR_6H-COOH;

CH_2-CHOH-CH_2OH;

CH_2-CO-COOH;

CH_2-COOH;

CH_2-CHO;

CH_2-CH_2OH;

CHOH-CH_2OH;

CH_2-O-CHO;

COOH; or

CHO and

R_5 = CH_2-COOH or

COOH,

or which are a salt, an ester or an amide thereof, in particular chlorophyll, porphyrin, and phospholipid and di- or triacylglyceryl esters.

3. A method according to claim 2, characterised in that said product comprises as said PPAR/RXR heterodimer activator or as said

precursor thereof at least one compound selected from the group of compounds which correspond to the following formulas:

CH_3-CR_1H-CH_2-CH_2-CH_2-CR_2H-CH_2-CH_2-CH_2-CR_3H-CH_2-CH_2-$(CH_2)_m$-R_4

wherein:

R_1, R_2, R_3 and R_6 = CH_3;

m = 0; and

R_4 = CH_2-CR_6=CH-CH_2OH (phytol);

CH_2-CR_6H-CH_2-COOH (phytanic acid); or

CH_2-CR_6H-COOH (pristanic acid),

COOH (4,8,12-TMTD);

or which are a salt, an ester or an amide thereof, in particular chlorophyll.

4. A method according any one of the claims 1 to 3, characterised in that said PPAR/RXR heterodimer activator is phytanic acid, pristanic acid, TMTD (4,8,12-trimethyltridecanoic acid), a derivative of these acids or a combination thereof, the PPAR/RXR heterodimer activator being preferably phytanic acid and/or pristanic acid.

5. A method according to any one of the claims 1 to 4, characterised in that said product comprises phytol.

6. A method according to any one of the claims 1 to 5, characterised in that the livestock animals are slaughtered to produce said livestock product, in particular to produce skeletal meat, and the livestock animals are made to ingest said product for at least three days during the last week before the slaughtering.

7. A method according to any one of the claims 1 to 6, characterised in that the livestock animals are non-ruminant mammals or poultry, said product being given to the livestock animals so that a level of said PPAR/RXR heterodimer activator of at least 0.2%, preferably of at least 0.5% and more preferably of at least 1.0% of total FAME fatty acids (comprising a linear chain of at least 12 carbon atoms) is achieved in said

livestock product, in particular in skeletal meat of the livestock animals, the non-ruminant mammals being preferably non-rodents.

8. A method according to claim 7, characterised in that said livestock animals are poultry and said livestock products eggs, said product being given to the livestock animals so that a level of said PPAR/RXR heterodimer activator of at least 1%, preferably of at least 3% and more preferably of at least 5% of total FAME fatty acid is achieved in egg yolk of said eggs.

9. A method according to any one of the claims 1 to 6, characterised in that the livestock animals are ruminants, said product being given to the livestock animals so that a level of said PPAR/RXR heterodimer activator of at least 0.7%, preferably of at least 0.9% and more preferably of at least 1.0% of total FAME fatty acid is achieved in skeletal meat of the livestock animals.

10. A method according to any one of the claims 1 to 6, characterised in that the livestock animals are ruminants, said product being given to the livestock animals so that a level of said PPAR/RXR heterodimer activator higher than 0.75%, preferably higher than 1.0% and more preferably higher than 1.5% of total FAME fatty acids is achieved in milk of the livestock animals.

11. A method according to claim 9 or 10, characterised in that said product comprises chlorophyll in a concentration of at least 0.25% by dry weight, preferably of at least 0.50% by dry weight and more preferably of at least 0.75% by dry weight.

12. A method according to any one of the claims 1 to 6, characterised in that the livestock animals are aquatic animals used to produce said livestock product in aquaculture, said product being given to the livestock animals so that a level of said PPAR/RXR heterodimer activator of at least 0.7%, preferably of at least 0.9% and more preferably

of at least 1.0% of total long chain fatty acids is achieved in said livestock product.

13. A method according to any one of the claims 1 to 12, characterised in that said product is given at least once a day during said period of at least three days, said product being preferably given with the feed of the livestock animals.

14. A method according to any one of the claims 1 to 13, characterised in that said predetermined amount of said product contains at least 25 x F meq., preferably at least 35 x F meq., more preferably at least 50 x F meq., and most preferably at least 65 x F meq of said PPAR/RXR heterodimer activator and/or precursor thereof.

15. A method according to any one of the claims 1 to 14, characterised in that said predetermined amount of said product contains less than 175 x F meq., and preferably less than 125 x F meq of said PPAR/RXR heterodimer activator and/or precursor thereof.

16. A method according to any one of the claims 1 to 15, characterised in that for an initial trial period, during which the livestock animals are made to ingest said product, a parameter influenced by the ingestion of said product in at least a number of the individual livestock animals is determined and, after the initial trial period, the livestock animals are split up into at least two groups based on a difference in effect of said product on said parameter, the parameter which is determined being preferably the gain of weight and/or the feed intake of the individual livestock animals.

17. A method to supplement the human diet with a PPAR/RXR heterodimer activator, in which method livestock animals, used in agri- or aquaculture for producing a livestock product for human consumption, are made to ingest at least one product comprising said PPAR/RXR heterodimer activator and/or a precursor thereof which is metabolised by the livestock animals into said PPAR/RXR heterodimer

activator, over such a period of time and in such an amount that the PPAR/RXR heterodimer activator is accumulated in the livestock animal so that an increased PPAR/RXR heterodimer activator level is achieved in the livestock product, characterised in that said PPAR/RXR heterodimer activator is phytanic acid, a metabolite of phytanic acid, a derivative of phytanic acid or of said metabolite, or a combination thereof and, in order to accumulate the PPAR/RXR heterodimer activator in the livestock animal, a predetermined amount of said product is given to the livestock animals over at least one period of at least three days, during which the livestock animals ingest a total amount of F kg feed dry weight, which predetermined amount of said product contains at least 5 x F meq, preferably at least 10 x F meq, and more preferably at least 15 x F meq of said PPAR/RXR heterodimer activator and/or precursor thereof.

18. A method for improving the quality of carcass and meat of livestock animals, in particular of pigs, characterised in that the livestock animals are made to ingest at least one product which comprises a PPAR/RXR heterodimer activator selected from the group consisting of phytanic acid, metabolites of phytanic acid, and derivatives of phytanic acid and of said metabolite, and/or a precursor thereof which is metabolised by the livestock animals into said PPAR/RXR heterodimer activator, and, in order to achieve an improved skeletal meat quality, a predetermined amount of said product is given to the livestock animals over at least one period of at least three days, during which the livestock animals ingest a total amount of F kg feed dry weight, which predetermined amount of said product contains at least 5 x F meq, preferably at least 10 x F meq, and more preferably at least 15 x F meq of said PPAR/RXR heterodimer activator and/or precursor thereof.

19. A method according to claim 18, characterised in that said product comprises phytol.

20. A livestock product for human consumption, in particular a livestock product for human consumption obtainable by a method according to any one of the claims 1 to 16, which live stock product comprises at least one PPAR/RXR heterodimer activator selected from the group consisting of phytanic acid, metabolites of phytanic acid and derivatives of phytanic acid and of said metabolites, characterised in that the livestock product comprising egg yolk of poultry eggs, which egg yolk has a level of said PPAR/RXR heterodimer activator of at least 1%, preferably of at least 3% and more preferably of at least 5% of total FAME fatty acids, the livestock product being in particular poultry eggs.

21. A livestock product according to claim 20, characterised in that the livestock product comprises at least 0.5 kg egg yolk.

22. A livestock product for human consumption, in particular a livestock product for human consumption obtainable by a method according to any one of the claims 1 to 16, which live stock product comprises at least one PPAR/RXR heterodimer activator selected from the group consisting of phytanic acid, metabolites of phytanic acid and derivatives of phytanic acid and of said metabolites, characterised in that the livestock product is skeletal meat of non-ruminant mammals or poultry having a fat content of maximum 70% on dry weight basis and a level of said PPAR/RXR heterodimer activator of at least 0.2%, preferably of at least 0.5% and more preferably of at least 1.0% of total FAME fatty acids.

23. A livestock product for human consumption, in particular a livestock product for human consumption obtainable by a method according to any one of the claims 1 to 16, which live stock product comprises at least one PPAR/RXR heterodimer activator selected from the group consisting of phytanic acid, metabolites of phytanic acid and derivatives of phytanic acid and of said metabolites, characterised in that the livestock product is skeletal meat of ruminants having a fat content of

maximum 70% on dry weight basis and having a level of said PPAR/RXR heterodimer activator of at least 0.7%, preferably of at least 0.9% and more preferably of at least 1.0% of total FAME fatty acids.

24. A livestock product for human consumption, in particular a livestock product for human consumption obtainable by a method according to any one of the claims 1 to 16, which live stock product comprises at least one PPAR/RXR heterodimer activator selected from the group consisting of phytanic acid, metabolites of phytanic acid and derivatives of phytanic acid and of said metabolites, characterised in that the livestock product contains a mixture of milk of at least 8 ruminants having a level of said PPAR/RXR heterodimer activator higher than 0.75%, preferably higher than 1.0% and more preferably higher than 1.5% of total FAME fatty acids.

25. A livestock product for human consumption, in particular a livestock product for human consumption obtainable by a method according to any one of the claims 1 to 16, which live stock product comprises at least one PPAR/RXR heterodimer activator selected from the group consisting of phytanic acid, metabolites of phytanic acid and derivatives of phytanic acid and of said metabolites, characterised in that the livestock product are aquatic animals, in particular aquatic animals defined in the main group 4 "Fish and fish products" of the Europcode 2 version of 4/8/99, having a level of said PPAR/RXR heterodimer activator of at least 4.0%, preferably of at least 5.0%, more preferably of at least 6.0% and most preferably of at least 8.0% of total FAME fatty acids.

26. A feed for livestock animals for use in a method according to any one of the claims 1 to 19, characterised in that it comprises a PPAR/RXR heterodimer activator selected from the group consisting of phytanic acid, metabolites of phytanic acid, and derivatives of phytanic acid and of said metabolite, and/or a precursor thereof which is metabolised by the livestock animals into said PPAR/RXR heterodimer

activator, the feed being composed to contain at least 5 meq/kg feed dry weight, preferably at least 10 meq/kg feed dry weight, and more preferably at least 15 meq/kg feed dry weight of said PPAR/RXR heterodimer activator and/or precursor thereof.

27. A feed according to claim 25, characterised in that it contains at least 5 meq/kg feed dry weight, preferably at least 10 meq/kg feed dry weight, and more preferably at least 15 meq/kg feed dry weight of phytol.